## **CLAIMS**

- 1. An energized fusion protein Fv-LDP-AE consisting of a fusion protein Fv-LDP that contains the single-chain Fv fragment (scFv) of monoclonal antibody against type IV collagenase, the apoprotein of lidamycin (LDP), the flexible spacer GGGGS between scFv and LDP, and a C-terminal His6-tag; and an active enedigne chromophore (AE) that derives from lidamycin.
- 2. The energized fusion protein Fv-LDP-AE of claim 1, wherein the gene sequence coding for said Fv-LDP is set forth in SEQ ID NO: 1, the amino acid sequence of said Fv-LDP is set forth in SEQ ID No: 2.
- 3. A method for producing Fv-LDP-AE of claim 1, comprising:
  - a. Preparing the fusion protein Fv-LDP;
  - b. Executing molecular reconstitution by mixing AE that derives from LDM containing high percentage of AE with said fusion protein Fv-LDP.
- 4. The method of claim 3, wherein said Fv-LDP in 0.01 M PBS (pH 7.0) solution is mixed with AE in methanol solution by a molecular ratio of 1:5 and a volume ratio of 1:50, reacting at room temperature for 12 h, and the energized fusion protein Fv-LDP-AE is obtained.
- 5. The method of claim 3, wherein said LDM has high percentage of AE which is at least 80%, and preferably 90% of its whole chromophores.
- 6. Use of energized fusion protein Fv-LDP-AE of claim 1 in preparation of anti-angiogenic and novel antibody-based, tumor- targeting medicament.
- 7. The use of claim 6, wherein said tumor is selected from the group consisting of solid tumors such as colon carcinoma, rectum carcinoma, esophageal carcinoma, gastric carcinoma, and hepato-carcinoma; breast carcinoma; ovarian carcinoma; lung carcinoma and renal carcinoma.
- 8. A pharmaceutical composition comprising therapeutically effective amount of energized fusion protein of claim 1, and optionally, pharmaceutical acceptable carrier and/or excipient.
- 9. A method for treating tumors in human comprising administering therapeutically effective amount of energized fusion protein of claim 1 or said pharmaceutical composition of claim 8 to a patient with tumor.